

Method and apparatus for the interactive control of a machine**Description**5 **Reference to related applications**

The present application claims the priority of German patent application 103 34 153.6, filed on 26.07.2003, the disclosure contents of which are hereby expressly also made the object of the present application.

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Field of the invention

15 The invention relates to a method and an apparatus for the interactive control of a machine, more especially a plastics material injection molding machine in accordance with the preamble of claims 1 and 15.

State of the art

Such a method is known in EP 0 573 912 B1. In this case, basic knowledge or a data set covering the basic rules of the operation of an injection molding machine is recorded in a data processing unit. The machine additionally detects the existing machine configuration and machine environment such as, for example, peripheral devices, and offers the machine user a sequence editor to generate a machine sequence. On account of the information present in the data processing unit covering sequences and machine, at input there is always only a selected choice of input possibilities made available to the operator visually on a screen surface for additional parts of the sequence, on the part of machine and injection molding tool, that can be added in a compatible manner to the already existing parts. This means that the input of operating sequences is simplified and facilitated.

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Nevertheless, as previously, the operator has to input the creation of the interactive operating sequence using conventional keyboards which means that, in spite of the selected choice of input possibilities, the operator has to be trained to know which input

fields of the keyboard have to be actuated for an input. This necessitates corresponding expenditure on training and can result in time lost in the injection molding operation.

DE 102 46 925 A1 proposes the independent selection of safety conditions for an injection molding machine, such that a choice of actuating elements can be provided based on the safety conditions chosen. A link is certainly made between the basic information of the injection molding process and the safety conditions, but a spatial limitation or defining of the input fields for the navigation on the operating surface is only provided for the first navigation level. An additional navigation level and a sequence diagram are provided on the screen surface, however, not in a region of a stationary navigation surface.

The evaluation of injection parts manufactured on an injection molding machine by setting tolerance bands and the use of a joystick for program selection is known in DE 35 15 45 360 A1, more especially column 7, lines 37 – 42.

Summary of the invention

Proceeding from this state of the art, the object of the present invention is to improve a method and an apparatus for the interactive control of an injection molding machine to the effect that the creation of a sequence is further simplified.

This object is achieved by means of a method and an apparatus with the features of claims 1 and 15.

The operator interface is further improved in that the controlling means presents the operator with a choice of actuating fields for navigation, also selected, which makes it easy for him to select the input possibilities for the additional parts of the operating sequence from this selected choice. He is presented on the surface with dynamic input fields, which alter each time the user makes an input, such that, as the creation of the operating sequence progresses, the input possibilities for the operator become clearer and clearer. This makes the input clearer to the operator.

In addition, it is preferable for the surface to be divided in such a manner that simplified navigation is possible. Using a few lines or columns, which are definable on the screen